Clark Fork River Basin Groundwater Technical Conference

Clark Fork Basin Task Force

University of Montana and Montana Department of Natural Resources, Missoula Montana

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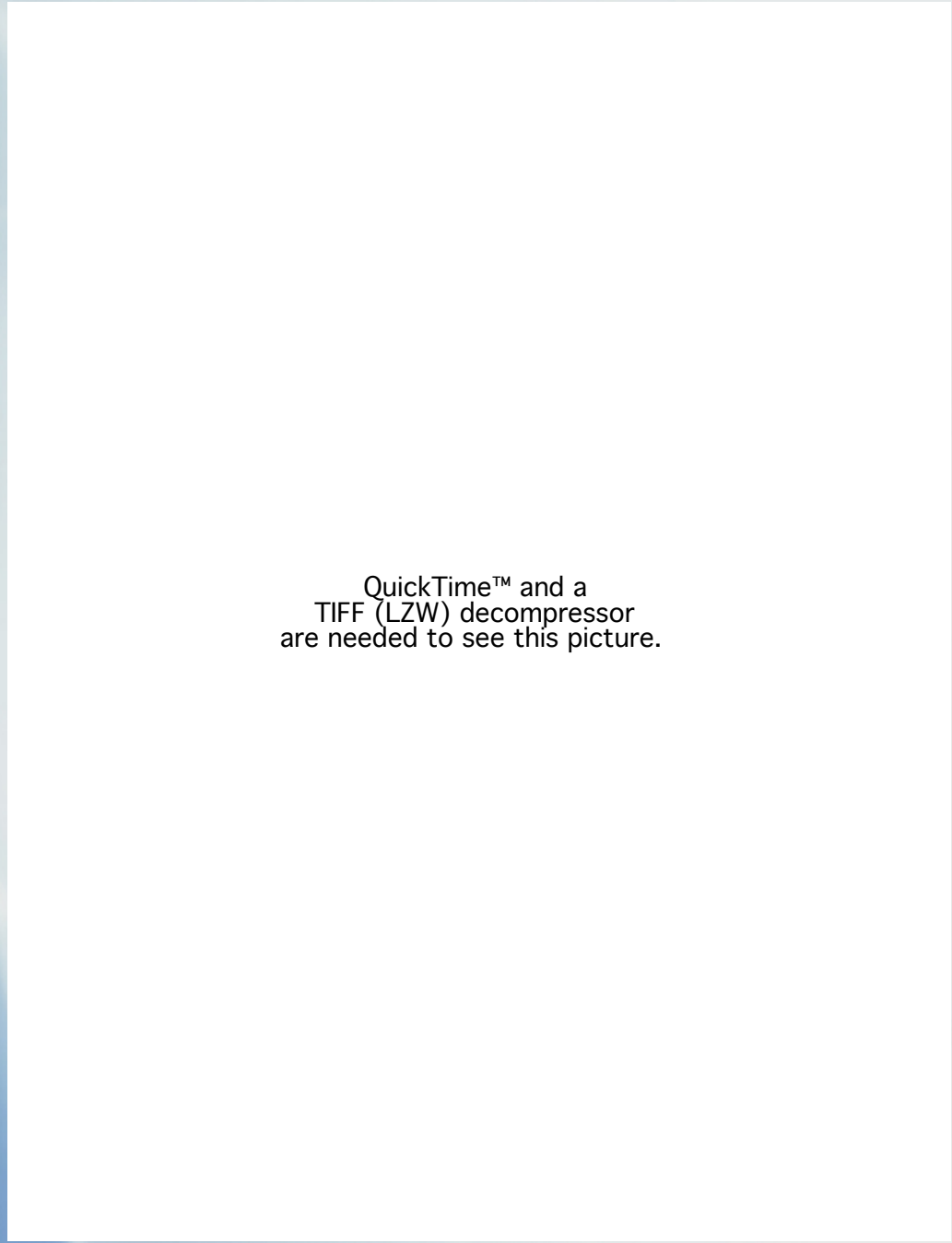
Status of Groundwater within the Basin

- Work has been completed - studies started near the turn of the 20th Century and continue to present
  - Geology
  - Hydrology/Hydrogeology
  - Most recent work - recognition that surface and ground water are connected

The Clark Fork Basin

Widely varying conditions

climate, soils, geology



Groundwater Management Tools

- Quantify the resource
- Quantify the use -

  Consumptive use vs. Non-Consumptive use
- Interpret the Data

  Maps - geologic, water surface, precipitation, evapotranspiration

  Models - conceptual, physical, analog, digital

  geochemical and hydraulic

Case Studies

- Eastern Snake River Plain
  - Effects take long time to propagate extending both up and downstream.
  - Effects 1/3 each: drought, irrigation conversion, extraction
  - Used Model to develop management tools.
  - Man has extensively modified the hydrology.
  - Management very complex - legal and physical issues
  - Courts have redefined management basis.
  - Manage on basin scale

Case Studies

- Smith River

  Caused proposed augmentation legislation.

  Impact on exempt wells - proposed change

  35 gpm 1ac-ft

  Need to manage our water in light of future needs

  Need for interim Legislative Water Policy committee

Case Studies

- Spokane River Rathdrum Aquifer
- Wide spectrum data collection

  Determined groundwater recharge zones and time of travel.

  Basic water chemistry determined zone of influence.

  Metal migration was limited and processes other than mixing were active.

  Data collection and methods - data is needed.

  Temperature and Heat Transport modeling

  - Smith River - surface groundwater modeling

    Longitudinal profile - gaining reaches

    Use emerging technology

Case Studies

- Gallatin Valley

  artifical recharge - opportunity for stream flow management.

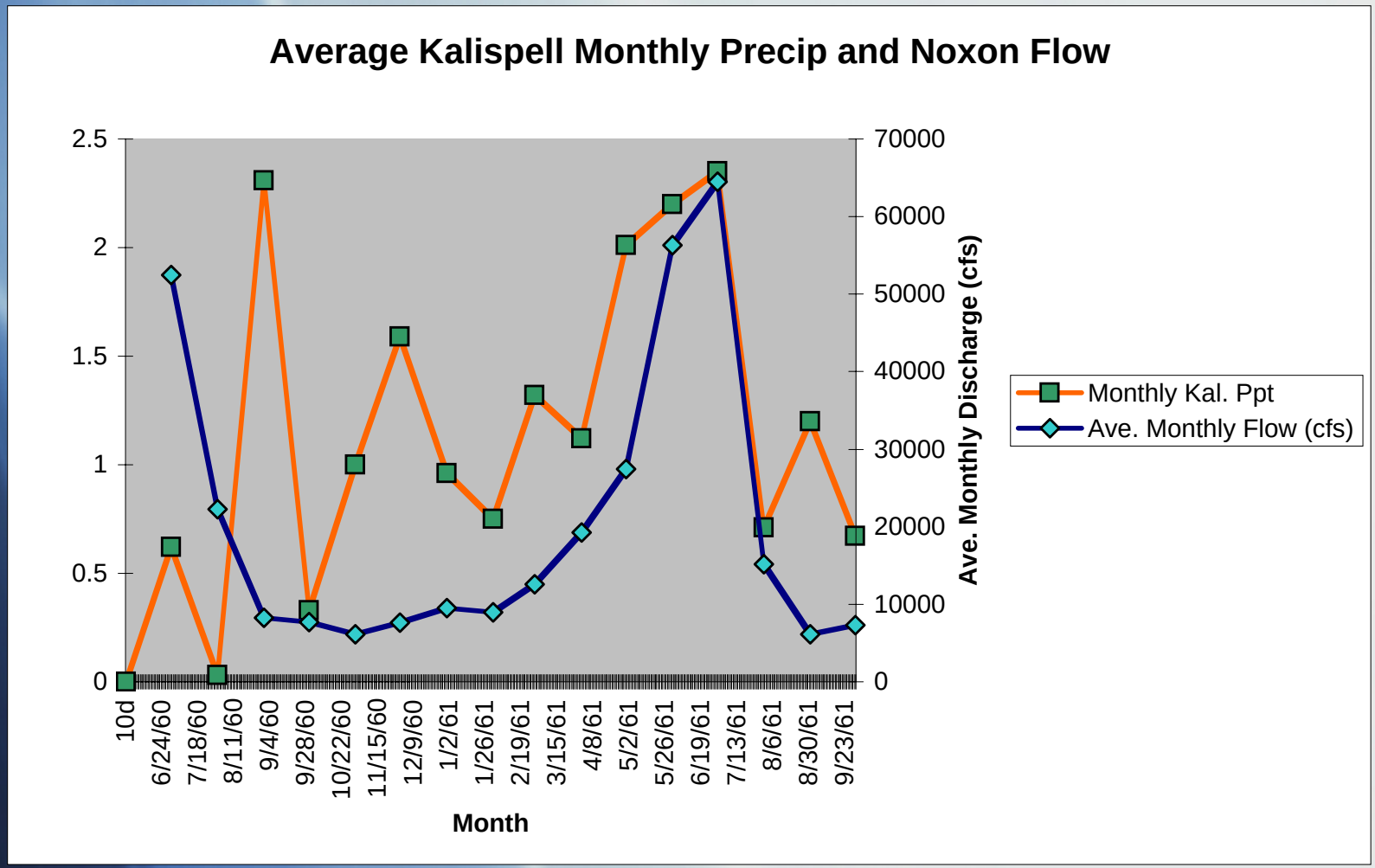
  Irrigation return flow modifies stream hydrograph increases base flow.

  Removal of irrigation - increased summer flows and decreases fall and winter flows. Improved efficiency does not improve base flows.

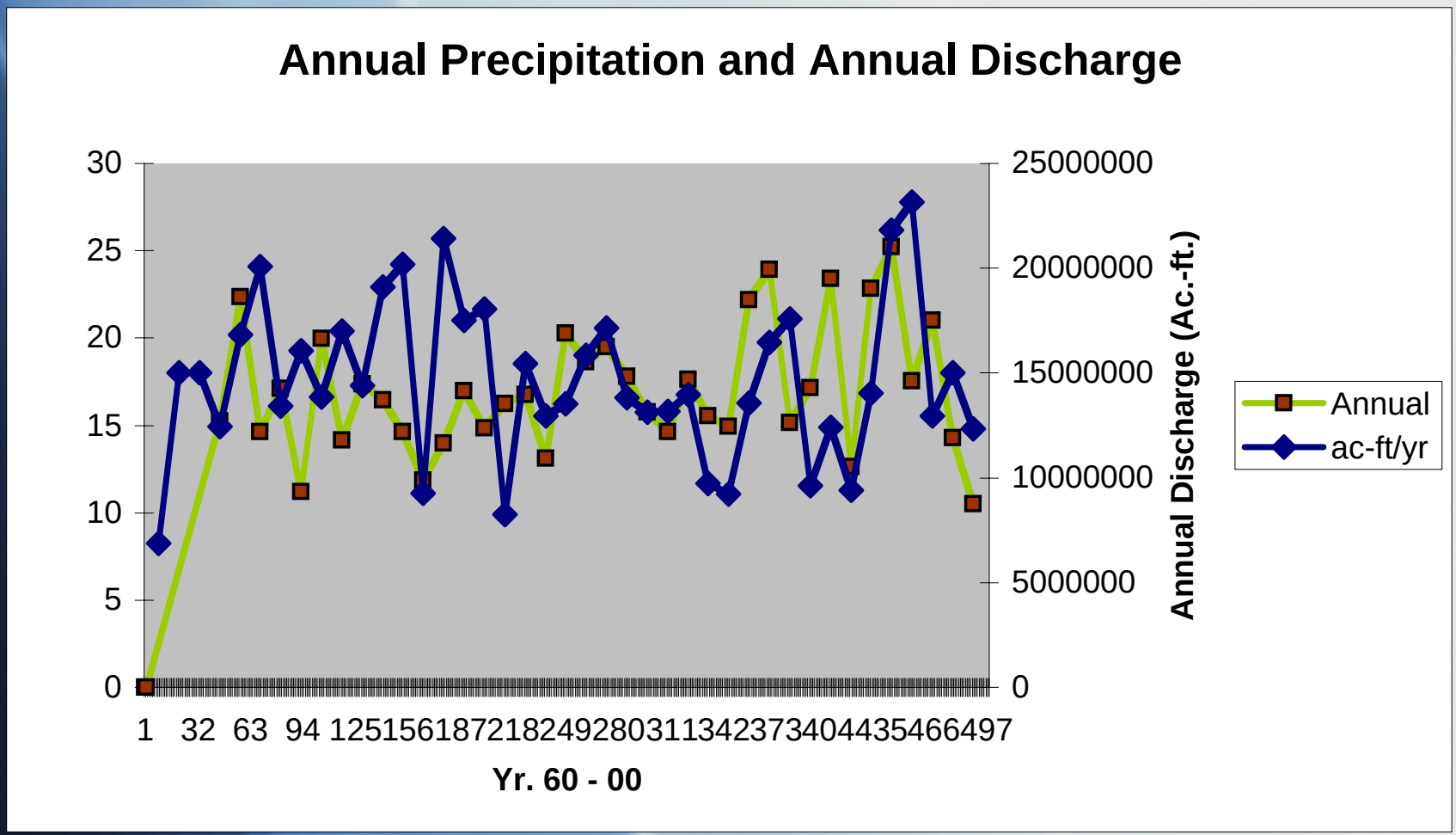
Groundwater Management Needs

- Site Specific
- Basin Scale
- Competing Needs - Man as a part of the ecosystem

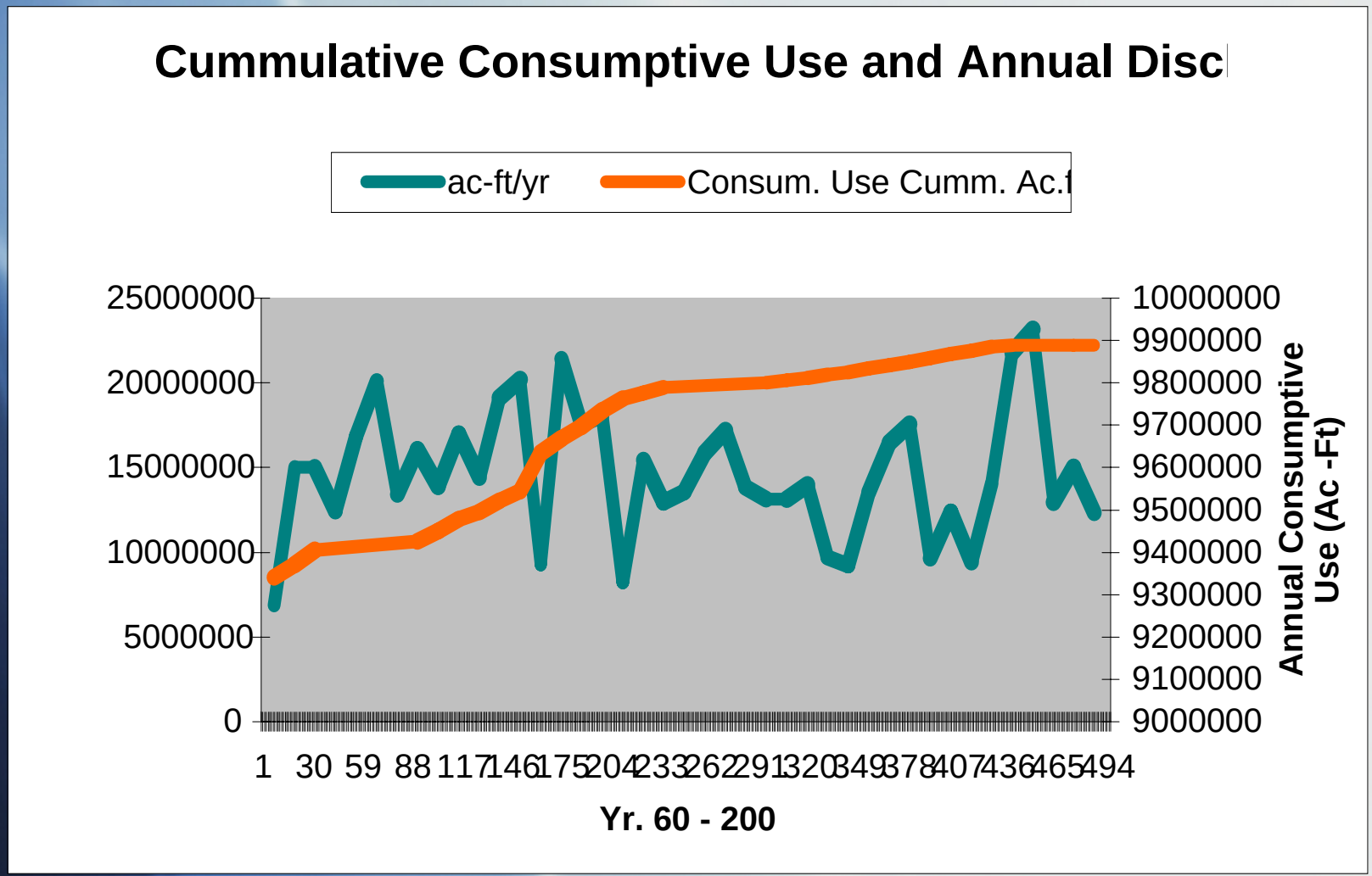
Monthly Precipitation and Discharge



Annual Precipitation and Discharge



Impact of Appropriation on Discharge



Consumptive use is < 4% of average annual discharge

What next?

- Identify a management goal.
  - What do we want to manage?
  - Need more monitoring wells.
- Coordinate water management among and within the various agencies within the State.
- Coordinate water allocation among the states sharing the Columbia River.
- Develop list of information needs for funding recommendations to Legislature and Public research institutions.